



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/519,914

01/03/2005

Koichi Sato

03500.017360.

3004

5514

7590

08/05/2008

FITZPATRICK CELLA HARPER & SCINTO  
30 ROCKEFELLER PLAZA  
NEW YORK, NY 10112

EXAMINER

CHEUNG, WILLIAM K

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

08/05/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/519,914	<b>Applicant(s)</b> SATO ET AL.	
	<b>Examiner</b> WILLIAM K. CHEUNG	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 April 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 11-14, 16-22 and 25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-14 and 16-22 is/are rejected.
- 7) ☒ Claim(s) 25 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>040808</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

1. In view of the amendment filed April 11, 2008, claims 1- 10, 15, 23-24 have been cancelled, and new claims 25 have been added. Claims 11-14, 16-22, 25 are pending.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 11-14, 16-22 are rejected under 35 U.S.C. 103(a) as obvious over Sano et al. (US 2003/0144377 A1) for the reasons adequately set forth from paragraph 4 of the office action of January 11, 2008.

11. (Currently Amended) A polymer-containing composition comprising a block polymer compound, water or an aqueous solvent, and a functional material,

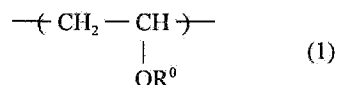
wherein the block polymer compound comprises block segments A, B, and C arranged in succession,

the block segment B is a hydrophilic block segment ~~or a stimulus-responsive hydrophobic block segment,~~

the block segment C is most hydrophilic while the block segment A is most hydrophobic,

the block segment C has an ionic group or an acidic group, and

the block segment C is a repeating unit represented by the following general formula (1):



wherein  $\text{R}^0$  represents  $-\text{X}-(\text{COOH})_i$  or  $-\text{X}-(\text{COO}-\text{M})_i$ ; X represents a linear, branched or cyclic alkylene group with 1 to 20 carbon atoms,  $-(\text{CH}(\text{R}^5)-\text{CH}(\text{R}^6)-\text{O})_p-(\text{CH}_2)_m-\text{CH}_{3-r}-$ ,  $-(\text{CH}_2)_m-(\text{O})_n-(\text{CH}_2)_q-\text{CH}_{3-r}-$  or a structure in which at least one of methylene groups therein is replaced by a carbonyl group or an aromatic ring structure; r represents 1 or 2; p represents an integer from 1 to 18; m represents an integer from 0 to 35; n represents 1 or 0; q represents an integer from 0 to 17; M represents a monovalent or polyvalent cation; and  $\text{R}^5$  and  $\text{R}^6$ , which may be the same or different, each independently represent an alkyl group.

14. (Currently Amended) A method of increasing the viscosity of a polymer-containing composition which comprises:

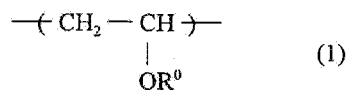
a block polymer compound comprising block segments A, B, and C arranged in succession, water or an aqueous solvent, and a functional material, wherein

the block segment B is a hydrophilic block segment ~~or a stimulus-responsive hydrophobic block segment,~~

the block segment C is most hydrophilic while the block segment A is most hydrophobic,

the block segment C has an ionic group or an acidic group, and

the block segment C is a repeating unit represented by the following general formula (1):



wherein  $\text{R}^0$  represents  $-\text{X}-(\text{COOH})_r$  or  $-\text{X}-(\text{COO-M})_r$ ; X represents a linear, branched or cyclic alkylene group with 1 to 20 carbon atoms,  $-(\text{CH}(\text{R}^5)-\text{CH}(\text{R}^6)-\text{O})_p-(\text{CH}_2)_m-\text{CH}_{3-r}$ ,

$-(\text{CH}_2)_m-(\text{O})_n-(\text{CH}_2)_q-\text{CH}_{3-r}$ , or a structure in which at least one of methylene groups therein is replaced by a carbonyl group or an aromatic ring structure; r represents 1 or 2; p represents an integer from 1 to 18; m represents an integer from 0 to 35; n represents 1 or 0; q represents an integer from 0 to 17; M represents a monovalent or polyvalent cation; and  $\text{R}^5$  and  $\text{R}^6$ , which may be the same or different, each independently represent an alkyl group,

the method comprising a step of bringing the composition in contact with hydrogen ions or metal cations to increase the viscosity of the composition.

16. (Currently Amended) An image forming method comprising a step of applying an ink onto a recording medium to conduct recording, wherein

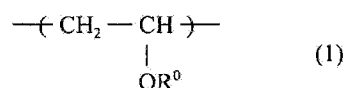
the ink is a polymer-containing composition including a block polymer compound comprising block segments A, B, and C arranged in succession, water or an aqueous solvent, and a functional material,

the block segment B is a hydrophilic block segment ~~or a stimulus-responsive hydrophobic block segment~~,

the block segment C is most hydrophilic while the block segment A is most hydrophobic,

the block segment C has an ionic group or an acidic group, and

the block segment C is a repeating unit represented by the following general formula (1):



wherein  $\text{R}^0$  represents  $\text{-X-(COOH)}_i$  or  $\text{-X-(COO-M)}_i$ ; X represents a linear, branched or cyclic alkylene group with 1 to 20 carbon atoms,  $\text{-(CH(R}^5\text{)-CH(R}^6\text{)-O)}_p\text{-(CH}_2\text{)}_m\text{-CH}_{3-r}$ ,  $\text{-(CH}_2\text{)}_m\text{-(O)}_n\text{-(CH}_2\text{)}_q\text{-CH}_{3-r}$ , or a structure in which at least one of methylene groups therein is replaced by a carbonyl group or an aromatic ring structure; r represents 1 or 2; p represents an integer from 1 to 18; m represents an integer from 0 to 35; n represents 1 or 0; q represents an integer from 0 to 17; M represents a monovalent or polyvalent cation; and  $\text{R}^5$  and  $\text{R}^6$ , which may be the same or different, each independently represent an alkyl group.

19. (Currently Amended) An image forming apparatus for conducting recording by applying an ink onto a recording medium, wherein

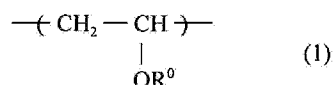
the ink is a polymer-containing composition including a block polymer compound comprising block segments A, B, and C arranged in succession, water or an aqueous solvent, and a functional material,

the block segment B is a hydrophilic block segment ~~or a stimulus-responsive hydrophobic block segment,~~

the block segment C is most hydrophilic while the block segment A is most hydrophobic,

the block segment C has an ionic group or an acidic group, and

the block segment C is a repeating unit represented by the following general formula (1):



wherein  $\text{R}^0$  represents  $\text{-X-(COOH)}$ , or  $\text{-X-(COO-M)}$ ; X represents a linear, branched or cyclic alkylene group with 1 to 20 carbon atoms,  $\text{-(CH(R}^5\text{)-CH(R}^6\text{)-O)}_p\text{-(CH}_2\text{)}_m\text{-CH}_{3-r}\text{-}$ ,

$\text{-(CH}_2\text{)}_m\text{-(O)}_n\text{-(CH}_2\text{)}_q\text{-CH}_{3-r}\text{-}$  or a structure in which at least one of methylene groups therein is

replaced by a carbonyl group or an aromatic ring structure; r represents 1 or 2; p represents an

integer from 1 to 18; m represents an integer from 0 to 35; n represents 1 or 0; q represents an

integer from 0 to 17; M represents a monovalent or polyvalent cation; and  $\text{R}^5$  and  $\text{R}^6$ , which may

be the same or different, each independently represent an alkyl group.

Art Unit: 1796

21. (Currently Amended) A method of increasing the viscosity of a polymer-containing composition which comprises:

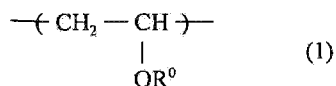
a block polymer compound comprising block segments A, B, and C arranged in succession, water or an aqueous solvent, and a functional material, wherein

the block segment B is a hydrophilic block segment ~~or a stimulus-responsive hydrophobic block segment,~~

the block segment C is most hydrophilic while the block segment A is most hydrophobic,

the block segment C has an ionic group or an acidic group, and

the block segment C is a repeating unit represented by the following general formula (1):



wherein  $\text{R}^0$  represents  $-\text{X}-(\text{COOH})_r$  or  $-\text{X}-(\text{COO}-\text{M})_r$ ; X represents a linear, branched or cyclic

alkylene group with 1 to 20 carbon atoms,  $-(\text{CH}(\text{R}^5)-\text{CH}(\text{R}^6)-\text{O})_p-(\text{CH}_2)_m-\text{CH}_{3-r}$ ,

$-(\text{CH}_2)_m-(\text{O})_n-(\text{CH}_2)_q-\text{CH}_{3-r}$ , or a structure in which at least one of methylene groups therein is

replaced by a carbonyl group or an aromatic ring structure; r represents 1 or 2; p represents an

integer from 1 to 18; m represents an integer from 0 to 35; n represents 1 or 0; q represents an

integer from 0 to 17; M represents a monovalent or polyvalent cation; and  $\text{R}^5$  and  $\text{R}^6$ , which may

be the same or different, each independently represent an alkyl group,

the method comprising a step of giving a stimulus to the composition ~~to cause the block segment B to become hydrophilic.~~

Sano et al. (page 13, claim 7) disclose a ABC type triblock copolymer comprising block A that is hydrophobic, Block B that is hydrophobic with other monomers added, and Block C that can be freely chosen. Since Block C can be freely chosen, Block C can also be chosen to be the hydrophilic since Block A is already hydrophobic. Regarding hydrophilic monomers, Sano et al. (page 4, 0078) disclose a block unit



comprising ethylenic monomer containing ionizable groups including carboxylic acid functionalities.

The difference between the invention of claims 11-14, 16-22 and Sano et al. is that the hydrophilic monomers of Sano et al. are silent on the ether spacer group between the polymer maintain chain and the carboxylic acid group of formula (1) of claim 11.

Since Sano et al. (page 4, 0078) disclose a block unit comprising ethylenic monomer containing ionizable groups including carboxylic acid functionalities, Sano et al. teach a family of compounds that generically include the compound as claimed (formula (1) of claim 1). Motivated by the expectation of success of obtaining the ABC triblock copolymers of Sano et al., it would have been obvious to one of ordinary skill in art to recognize and appreciate any ethylenic monomer containing ionizable groups including carboxylic acid functionalities, such as the formula (1) of claim 1 to obtain the invention of claims 11-14, 16-22.

### ***Response to Arguments***

4. Applicant's arguments filed April 11, 2008 have been fully considered but they are not persuasive.

Applicants argue that the Block A of Sano et al. should be recited as "hydrophilic", not "hydrophobic" because the application of Sano et al. (10/092,003, claim 7) recited "hydrophilic", not "hydrophobic". However, even the Block A of Sano et al. is corrected to "hydrophilic", Sano et al. is still a good reference for the instant

Art Unit: 1796

rejection because the Block C of Sano et al. can be chosen as hydrophobic block.

According to the following table, since block A and C are terminal blocks, there designation are arbitrary where Block A and Block C are functionally equivalent, or Block A can be designated as Block C, or vice versa. Therefore, the examiner has a reasonable basis to maintain the rejection set forth.

	Block A	Block B	Block C
Applicants' (Claims 11, 14, 16, 19, 21)	hydrophobic	hydrophilic	Most hydrophilic
Sano et al. (corrected claim 7)	Hydrophilic (can be designated as Block C)	Hydrophobic comprises non-ionic hydrophilic monomers (page 4, 0080)	Can be chosen to be hydrophobic (can be chosen as Block A)

Regarding applicants' argument that the amended claims requires Block B to be hydrophilic, applicants must recognize that the ABC triblock copolymer as claimed requires Block A to hydrophobic and Block C to be the most hydrophilic. Therefore, the claim 21 as written requires Block B to have hydrophobicity or hydrophilicity to be intermediate between that of Block A and Block C. Since Sano et al. (page 4, 0080) clearly indicate that non-ionic hydrophilic monomers can be incorporated for adjusting hydrophobic/hydrophilic balance of the blocks, the examiner has a reasonable basis that the hydrophobic block B of Sano et al. and the hydrophilic Block B of claims 11, 14, 16, 19, 21 are substantially identical is hydrophobicity or hydrophilicity.

Regarding applicants' argument that the block B of Sano et al. is always hydrophobic, the examiner disagrees because Sano et al. (page 4, 0080) clearly indicate that non-ionic hydrophilic monomers can be incorporated for adjusting

hydrophobic/hydrophilic balance of the blocks. Further, Sano et al. (page 1, 0023; page 2, 0038; page 3, 0073; page 13, claim 7 (4); page 14, claim 15 (4)) also disclose amino block units that would change in polymer-polymer or polymer-aqueous solvent interaction (such as a change water solubility) in response to a change in pH.

### ***Allowable Subject Matter***

5. Claim 25 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Sano et al. do not teach the specific hydrophilic components of claim 25.

### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 1796

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William K. Cheung whose telephone number is (571) 272-1097. The examiner can normally be reached on Monday-Friday 9:00AM to 2:00PM; 4:00PM to 8:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David WU can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/William K Cheung/  
Primary Examiner, Art Unit 1796

William K. Cheung, Ph. D.

Primary Examiner

July 31, 2008

Application/Control Number: 10/519,914  
Art Unit: 1796

Page 12